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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/751,258 | 12/31/2003 | Michael K. Eschmann | ITL.1082US (P18346) | 7473 |
| 21906 | 7590 | 04/12/2006 | EXAMINER | |
| TROP PRUNER & HU, PC 8554 KATY FREEWAY SUITE 100 HOUSTON, TX 77024 | | | SCHLIE, PAUL W | |
| | | ART UNIT | PAPER NUMBER | |
| | | | 2186 | |

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/751,258 | ESCHMANN ET AL. |
| | Examiner | Art Unit |
| | Paul W. Schlie | 2186 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 24 March 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-30 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-30 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 31 December 2003 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Claims 1-30 have been examined as amended 3/24/06.

Response to Arguments

2. Applicant's arguments filed 3/24/06 have been fully considered but they are not persuasive.

With respect to claim 1, as the phrase "sustained random throughput is ultimately limited by the underlying disk speed" (Mandal et al. [0071]), is considered more properly interpreted as referring to their implementation which is effectively capable of only coalescing a small number of most recently received writes prior to their being spilled over into a larger but non-coalescing write cache when present; thereby although "The cache has little chance to coalesce random writes" (also Mandal et al. [0071]), as truly random writes to any cache which is small relative to main storage, will likely have a correspondingly small number of writes which may be coalesced, as the smaller the cache, the more likely that a previous write which it may have been capable of being coalesced with, was previously written back to make room for a then newly received but correspondingly non-coalesced write for the same reason; thereby sustained truly random write cache performance is typically ultimately limited by such a system's main storage performance as quoted); thereby the rejection is sustained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 11 and 21 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mandal et al. (US App. 2003/0088713).

As per independent claims 1, 11 and 21, Mandal et al. teaches a system and/or method comprising the means to cache multiple logical disk block write requests and subsequently coalesce them into a single logical disk write request to improve the effective efficiency of a disk storage system which may itself comprise executable code (page 1 columns 1-2 paragraphs 5-7), but does not explicitly teach the use of any particularly cache architecture, however official notice is given that it is well-understood by those of ordinary skill in the art that caches may be composed of lines being organized in potentially multiple sets and/or ways, therefore it is considered correspondingly obvious to one of ordinary skill in the art that distinctly cached disk blocks may be cached in correspondingly distinct cache lines, thereby multiple cache lines may be correspondingly written to a disk drive in the same said coalesced logical disk block write request.

6. Claims 2-10, 12-20 and 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mandal et al. (US App. 2003/0088713) in further in view of Herbst et al. (US App. 2003/0145165).

As per claims 2-10, 12-20 and 22-30, being dependant on claim 1, 11, 21 or correspondingly dependent claim inclusively, Mandal et al. further teaches that cached written disk blocks may be identified with a dirty bit (page 4 column 2 paragraph 54), that multiple disk block cached lines may be flushed in the same operation (page 7 column 2 paragraph 74), that the cache may be composed of non-volatile memory (page 1 column 1 paragraph 3), and that said coalesced disk block writes may coalesce sequential writes (page 7 column 1 paragraph 71), but does not explicitly teach that such blocks may be identified by locating contiguous blocks (i.e. being logically ordered in a relative direction one greater or less than any other correspondingly identified block); however Mandal et al. teaches that such blocks may be located and identified as being contiguous. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to combine that taught by Mandal et al. with that taught by Herbst et al. to identify blocks which may be coalesced by searching for blocks which may be sequentially ordered one greater than the greatest or one less than the smallest logical block number previously identified as being correspondingly sequential, in any manor logically consistent with a given cache organization, for the benefit of identifying blocks which may be coalesced into a single logical disk write to improve the efficiency of a disk storage system.

Any potentially remaining claim limitation not explicitly addressed is considered obviously inherent in that taught, and/or not sufficient to patentably distinguish over prior art.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul W. Schlie whose telephone number is 571-272-6765. The examiner can normally be reached on Mon-Thu 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 517-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


PIERRE BATAILLE
PRIMARY EXAMINER
4/6/06